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# Ecology

Ecology (from Greek: οἶκος, "house", or "environment"; -λογία, "study of") is the branch of biology which studies the interactions among organisms and their environment. Objects of study include interactions of organisms with each other and with abiotic components of their environment. Topics of interest include the biodiversity, distribution, biomass, and populations of organisms, as well as cooperation and competition within and between species. Ecosystems are dynamically interacting systems of organisms, the communities they make up, and the non-living components of their environment. Ecosystem processes, such as primary production, pedogenesis, nutrient cycling, and niche construction, regulate the flux of energy and matter through an environment. These processes are sustained by organisms with specific life history traits. Biodiversity means the varieties of species, genes, and ecosystems, enhances certain ecosystem services.

Ecology is not synonymous with environmentalism, natural history, or environmental science. It overlaps with the closely related sciences of evolutionary biology, genetics, and ethology. An important focus for ecologists is to improve the understanding of how biodiversity affects ecological function. Ecologists seek to explain:

Life processes, interactions, and adaptations

The movement of materials and energy through living communities

The successional development of ecosystems

The abundance and distribution of organisms and biodiversity in the context of the environment.

Ecology has practical applications in conservation biology, wetland management, natural resource management (agroecology, agriculture, forestry, agroforestry, fisheries), city planning (urban ecology), community health, economics, basic and applied science, and human social interaction (human ecology). For example, the Circles of Sustainability approach treats ecology as more than the environment 'out there'. It is not treated as separate from humans. Organisms (including humans) and resources compose ecosystems which, in turn, maintain biophysical feedback mechanisms that moderate processes acting on living (biotic) and non-living (abiotic) components of the planet. Ecosystems sustain life-supporting functions and produce natural capital like biomass production (food, fuel, fiber, and medicine), the regulation of climate, global biogeochemical cycles, water filtration, soil formation, erosion control, flood protection, and many other natural features of scientific, historical, economic, or intrinsic value.

The word "ecology" ("Ökologie") was coined in 1866 by the German scientist Ernst Haeckel. Ecological thought is derivative of established currents in philosophy, particularly from ethics and politics. Ancient Greek philosophers such as Hippocrates and Aristotle laid the foundations of ecology in their studies on natural history. Modern ecology became a much more rigorous science in the late

19th century. Evolutionary concepts relating to adaptation and natural selection became the cornerstones of modern ecological theory.

### Natural Environment

The natural environment encompasses all living and non-living things occurring naturally, meaning in this case not artificial. The term is most often applied to the Earth or some parts of Earth. This environment encompasses the interaction of all living species, climate, weather, and natural resources that affect human survival and economic activity. The concept of the natural environment can be distinguished as components:

Complete ecological units that function as natural systems without massive civilized human intervention, including all vegetation, microorganisms, soil, rocks, atmosphere, and natural phenomena that occur within their boundaries and their nature.

Universal natural resources and physical phenomena that lack clear-cut boundaries, such as air, water, and climate, as well as energy, radiation, electric charge, and magnetism, not originating from civilized human actions

In contrast to the natural environment is the built environment. In such areas where man has fundamentally transformed landscapes such as urban settings and agricultural land conversion, the natural environment is greatly modified into a simplified human environment. Even acts which seem less extreme, such as building a mud hut or a photovoltaic system in the desert, modify the natural environment into an artificial one. Though many animals build things to provide a better environment for themselves, they are not human, hence beaver dams and the works of Mound-building termites are thought of as natural.

People seldom find absolutely natural environments on Earth, and naturalness usually varies in a continuum, from 100% natural in one extreme to 0% natural in the other. More precisely, we can consider the different aspects or components of an environment, and see that their degree of naturalness is not uniform. If, for instance, in an agricultural field, the mineralogic composition and the structure of its soil are similar to those of an undisturbed forest soil, but the structure is quite different.

Natural environment is often used as a synonym for habitat. For instance , when we say that the natural environment of giraffes is the savanna.

# Plant

Plants are mainly multicellular, predominantly photosynthetic eukaryotes of the kingdom Plantae. They form the clade Viridiplantae (Latin for "green plants") that includes the flowering plants, conifers and other gymnosperms, ferns, clubmosses, hornworts, liverworts, mosses and the green algae, and excludes the red and brown algae. Historically, plants were treated as one of two kingdoms including all living things that were not animals, and all algae and fungi were treated as plants. However, all current definitions of Plantae exclude the fungi and some algae, as well as the prokaryotes (the archaea and bacteria).

Green plants have cell walls containing cellulose and obtain most of their energy from sunlight via photosynthesis by primary chloroplasts that are derived from endosymbiosis with cyanobacteria. Their chloroplasts contain chlorophylls a and b, which gives them their green color. Some plants are secondarily parasitic or mycotrophic and may lose the ability to produce normal amounts of chlorophyll or to photosynthesize. Plants are characterized by sexual reproduction and alternation of generations, although asexual reproduction is also common.

There are about 300–315 thousand species of plants, of which the great majority, some 260–290 thousand, are seed plants (see the table below). Green plants provide a substantial proportion of the world's molecular oxygen and are the basis of most of Earth's ecosystems, especially on land. Plants that produce grain, fruit and vegetables form humankind's basic foodstuffs, and have been domesticated for millennia. Plants have many cultural and other uses as ornaments, building materials, writing material and in great variety, they have been the source of medicines and drugs. The scientific study of plants is known as botany, a branch of biology

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| LESSON | TOPIC | ASSIGNMENT | Points | DUE |
| 1 | What is Distance Learning?? | Wiki #1 | 10 | March 10 |
| Presentation | 20 |  |
| 2 | History & Theories | Brief Paper | 20 | March 24 |
| Spring Break | | | | |
| 3 | Distance  Learners | Discussion #1 | 10 | April 7 |
| Group Selection | 50 | April 14 |
| 4 | Media Selection | Blog #1 | 10 | April 21 |

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### Forest

A forest is a large area dominated by trees. Hundreds of more precise definitions of forest are used throughout the world, incorporating factors such as tree density, tree height, land use, legal standing and ecological function. According to the widely used Food and Agriculture Organization definition, forests covered 4 billion hectares (9.9×109 acres) (15 million square miles) or approximately 30 percent of the world's land area in 2006.

Forests are the dominant terrestrial ecosystem of Earth, and are distributed across the globe. Forests account for 75% of the gross primary productivity of the Earth's biosphere, and contain 80% of the Earth's plant biomass.

Forests at different latitudes and elevations form distinctly different ecozones: boreal forests near the poles, tropical forests near the equator and temperate forests at mid-latitudes. Higher elevation areas tend to support forests similar to those at higher latitudes, and amount of precipitation also affects forest composition.

Human society and forests influence each other in both positive and negative ways. Forests provide ecosystem services to humans and serve as tourist attractions. Forests can also affect people's health. Human activities, including harvesting forest resources, can negatively affect forest ecosystems.

# Ecosystem

An ecosystem is a community made up of living organisms and nonliving components such as air, water and mineral soil, all interacting as a system. (However, ecosystems can be defined in many ways.) The biotic and abiotic components interact through nutrient cycles and energy flows. Ecosystems are the network of interactions among organisms, and between organisms and their environment. Ecosystems can be of any size but one ecosystem has a specific, limited space. On a larger scale, some scientists view the entire planet as one ecosystem).

Energy, water, nitrogen and soil minerals are other essential abiotic components of an ecosystem. The energy that flows through ecosystems comes primarily from the sun, through photosynthesis. Photosynthesis also captures carbon dioxide from the atmosphere. Animals also play an important role in the movement of matter and energy through ecoystems. They influence the amount plant and microbial biomass that lives in the system. As organic matter dies, decomposers release carbon back to the atmosphere. This process also facilitates nutrient cycling by converting nutrients stored in dead biomass back to a form that can be used again by plants and other microbes.

Ecosystems are controlled both by external and internal factors. External factors such as climate, the parent material that forms the soil, topography and time have a big impact on ecosystems, but they are not themselves influenced by the ecosystem. Ecosystems are dynamic: they are subject to periodic disturbances and are in the process of recovering from past disturbances that were external to the ecosystem. Internal factors are different. They not only control ecosystem processes but are also controlled by them. Internal factors are subject to feedback loops.

Humans operate within ecosystems and the cumulative effects of human activities can influence even external factors. Climate change is an example of that cumulative impact. Ecosystems provide benefits--called Ecosystem services--which people depend on and can disrupt to their own detriment. Best practices of Ecosystem management suggests that it's better to manage at the ecosystem level, rather than trying to managing individual species.